

REMARKS

The Final Office Action mailed May 4, 2005, has been received and reviewed. Claims 1 through 19 are currently pending in the application. Claims 1 through 19 stand rejected. Applicants propose to amend claims 1, 2, 4-6, 8, 9, and 11-19, and respectfully request reconsideration of the application herein.

**35 U.S.C. § 102(b) Anticipation Rejections**

Anticipation Rejection Based on U.S. Patent No. 6,438,029 to Hiraki et al.

Claims 1 through 19 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hiraki et al. (hereinafter "Hiraki"). (U.S. Patent No. 6,438,029). Applicants respectfully traverse this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Regarding Claim 1, the Office Action indicates the Hiraki reference teaches, "the claimed memory module on a semiconductor integrated circuit device, over one semiconductor substrate." The Examiner further states that she "can see no difference in novelty between a circuit on a board, a card, or an integrated circuit as long as the functionality is the same." After considering the Examiner's remarks, Applicants propose to amend claim 1 to recite "a memory module carrier substrate," rather than "a memory module substrate." Applicants further propose to amend claim 1 to include "discrete memory devices," rather than "memory devices." With these amendments, Applicants assert that the "plurality of **discrete** memory devices disposed on a memory module **carrier** substrate" is not found either expressly or inherently described, in Hiraki, as required for a 35 U.S.C. §102(e) rejection.

In amended claim 1, **discrete** memory devices are disposed on the memory module **carrier** substrate. The carrier substrate is not part of an integrated circuit and the memory

devices are discrete devices disposed on the carrier substrate. For example, one embodiment of a memory module is a dual in-line memory module (“DIMM”), in which the DIMM comprises a circuit board carrier substrate with discrete memory components disposed thereon.

Because the discrete memory devices are disposed on the memory module carrier substrate, they are removable upon failure. As stated in the specification, “upon completion of the testing process, any modules which failed the test may then be placed in an inexpensive apparatus as known in the art where the EEPROM may be read for the identities or locations of terminals and a failure map displayed. From the identities of the failing terminals, the corresponding failing part may be identified and marked for repair or replacement” (page 8, lines 14-17). In other words, a failed discrete memory device can be refurbished by physically replacing the discrete memory device or repairing the discrete memory device. After repair or replacement, the memory module may again be tested and the process repeated until none of the module parts fail a test.

It appears to Applicants that Hiraki does not describe a discrete memory device disposed on a carrier substrate as recited in amended claim 1, but rather describes, “a semiconductor integrated circuit device in which a volatile memory, such as a DRAM (Dynamic Random Access Memory) or a SRAM (Static Random Access Memory), and an electrically rewritable or reprogrammable nonvolatile memory, such as a flash memory, are packaged together with a control processing unit, such as a central processing unit, over a semiconductor substrate.” (Column 1 lines 14-21). In other words, in Hiraki, the substrate is an integrated circuit, rather than a carrier substrate. Furthermore, because the volatile memory is part of a system on a chip, on an integrated circuit, it is not a discrete memory device that can be physically removed and possibly replaced upon failure.

Also, amended claim 1 recites “at least one discrete non-volatile storage device disposed on the memory module carrier substrate ... configured for storing data indicating a location of at least one refurbishable failure associated with at least one of the plurality of discrete memory devices.” Thus, a defective discrete memory device can be refurbished, or in other words, the discrete memory device can be physically removed from the carrier substrate and replaced with a functional discrete memory device. Hiraki, on the other hand, does not appear to set forth “a

location of at least one refurbishable failure,” but rather teaches memory cell repair by disabling a defective memory cell and enabling a redundant memory cell.

For these reasons the Hiraki reference does not disclose each and every element as set forth in claim 1, either expressly or inherently described, as required for a valid 35 U.S.C § 102(e) rejection. Namely, the elements of “a memory module carrier substrate,” “a plurality of discrete memory devices,” and “at least one refurbishable failure” are not disclosed. As a result, Applicants request that the Examiner consider entry of the amendments to claim 1, because they do not add any new matter and place independent claim 1 in position for allowance. Further, if the amendments are entered, Applicants respectfully request the rejection of amended claim 1 be withdrawn.

Regarding claims 2-4, these claims depends from now allowable amended claim 1. Therefore, at least by virtue of their dependency from amended claim 1, claims 2-4 are now allowable and Applicants respectfully request that the rejection of claims 2-4 be withdrawn.

Regarding claim 5, the same arguments used with respect to claim 1 regarding “a memory module carrier substrate,” “a plurality of discrete memory devices,” and “at least one refurbishable failure” are also applicable for claim 5. For these reasons, Applicants assert that the Hiraki reference does not disclose each and every element as set forth in claim 5, either expressly or inherently described. As a result, Applicants request that the Examiner consider entry of the amendments to claim 5, because they do not add any new matter and place independent claim 5 in position for allowance. Further, if the amendments are entered, Applicants respectfully request the rejection of amended claim 5 be withdrawn.

Regarding claims 6-8, these claims depends from now allowable amended claim 5. Therefore, at least by virtue of their dependency from amended claim 5, claims 6-8 are now allowable and Applicants respectfully request that the rejection of claims 6-8 be withdrawn.

Regarding claim 9, the Office Action indicates the Hiraki reference teaches a testing

process of a memory module on a semiconductor integrated circuit device, over one semiconductor substrate. However, claim 9, as proposed to be amended, recites a method comprising, “testing a memory module including a memory module **carrier** substrate and a plurality of **discrete** memory devices disposed on the memory module **carrier** substrate.” As outlined above in the analysis of claim 1, Applicants assert that the “plurality of discrete memory devices disposed on a memory module carrier substrate” are discrete devices. In other words, discrete integrated circuit devices are disposed on the memory module carrier substrate, rather than being an integral part of an integrated circuit.

It appears to Applicants that Hiraki does not set forth a method of testing a memory module carrier substrate including discrete memory devices. Rather, it appears that Hiraki discloses “a semiconductor integrated circuit device in which a volatile memory, such as a DRAM (Dynamic Random Access Memory) or a SRAM (Static Random Access Memory), and an electrically rewritable or reprogrammable nonvolatile memory, such as a flash memory, are packaged together with a control processing unit, such as a central processing unit, over a semiconductor substrate” (Column 1 lines 14-21). Because the volatile memory is part of a system on a chip, on an integrated circuit, it cannot be physically removed and possibly replaced upon failure.

In addition, amended claim 9 recites, “identifying data indicative of a location of at least one refurbishable failure associated with at least one of the plurality of discrete memory devices.” Thus, a defective discrete memory device can be refurbished, or in other words, the discrete memory device can be physically removed from the carrier substrate and replaced with a functional discrete memory device. Hiraki, on the other hand, does not appear to set forth “a location of at least one refurbishable failure,” but rather teaches memory cell repair by disabling a defective memory cell and enabling a redundant memory cell.

For these reasons, the Hiraki reference does not disclose each and every element as set forth in claim 9, either expressly or inherently described, as required for a valid 35 U.S.C § 102(e) rejection. Namely, the elements of “testing a memory module including a memory module **carrier** substrate and a plurality of **discrete** memory devices disposed on the memory module **carrier** substrate” and “identifying data indicative of a location of at least one

refurbishable failure associated with at least one of the plurality of discrete memory devices,” are not disclosed. As a result, Applicants request that the Examiner consider entry of the amendments to claim 9, because they do not add any new matter and place independent claim 9 in position for allowance. Further, if the amendments are entered, Applicants respectfully request the rejection of amended claim 9 be withdrawn.

Regarding claims 10-14, these claims depends from now allowable amended claim 9. Therefore, at least by virtue of their dependency from amended claim 9, claims 10-14 are now allowable and Applicants respectfully request that the rejection of claims 10-14 be withdrawn.

Regarding claim 15, the Office Action indicates the Hiraki reference teaches fabrication of a memory module on a semiconductor integrated circuit device, over one semiconductor substrate. However, claim 15, as proposed to be amended, recites a method comprising, “placing a plurality of **discrete** memory devices on a memory module **carrier** substrate.” Applicants assert that the plurality of discrete memory devices placed on a memory module carrier substrate are discrete components. In other words, discrete integrated circuits devices are placed on the memory module carrier substrate, rather than being an integral part of an integrated circuit.

For these reasons the Hiraki reference does not disclose each and every element as set forth in claim 15, either expressly or inherently described, as required for a valid 35 U.S.C § 102(e) rejection. As a result, Applicants request that the Examiner consider entry of the amendments to claim 15, because they do not add any new matter and place independent claim 15 in position for allowance. Further, if the amendments are entered, Applicants respectfully request the rejection of amended claim 15 be withdrawn.

Regarding claims 16-19, these claims depends from now allowable amended claim 15. Therefore, at least by virtue of their dependency from amended claim 15, claims 16-19 are now allowable and Applicants respectfully request that the rejection of claims 16-19 be withdrawn.

**ENTRY OF AMENDMENTS**

The proposed amendments to claims 1, 2, 4-6, 8, 9, and 11-19 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search. Finally, if the Examiner determines that the amendments do not place the application in condition for allowance, entry is respectfully requested upon filing of a Notice of Appeal herein.

**CONCLUSION**

Claims 1-19 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



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